the Hotel Nettuno. It is true that we have professors' common rooms in this country, but there was a certain indefinable element about the "Sala dei Professori" which we seem rather to miss here.

G. H. BRYAN

NOTES.

WE announce with deep regret the death on August 26, in a flying accident, of Prof. Bertram Hopkinson, C.M.G., F.R.S., professor of mechanism and applied mechanics in the University of Cambridge.

THE position of the company known as British Dyes, Ltd., appears to have been at last determined by the results of a meeting at Huddersfield, on August 21, at which the shareholders approved, by an overwhelming majority, a scheme for amalgamation with Messrs. Levinstein, Ltd., of Manchester. It will be remembered that British Dyes, Ltd., was the company formed in 1915 on the basis of the previously well-known firm of colour-makers, Messrs. Read Holliday and Co., and subsidised by the Government to the extent of a million sterling, with extra provision for research. There have been many expressions of dissatisfaction with the progress made under the original directorate, and the view has already been expressed in the columns of NATURE that the board required amendment by a larger representation of science in its composition. In the statement made recently in the House of Commons by Sir Albert Stanley this aspect of the question was not referred to, but the conditions laid down appeared to afford satisfactory guarantees that after the war there would be such a restriction of imports as to afford time for the struggling industry to be firmly established, while the dye users would be sufficiently protected as to both supplies and prices. There can be no doubt that the amalgamation when effected will have good results in putting an end to undesirable competition between the two companies and in bringing the operations at British Dyes, Ltd., under the influence of Dr. Herbert Levinstein's experience, which really amounts to giving science, as against pure finance, a more definite position in respect to the affairs of the company. The history of the origin and progress of the famous colour works of the Badische Company at Ludwigshafen on the Rhine has still to be written so as to be at once instructive and convincing to the British commercial world.

THE David Livingstone centenary medal of the American Geographical Society has, it is stated in *Science*, been awarded to Col. Candido Mariano da Silva Rondon in recognition of his valuable work of exploration in South America.

IT is announced in *Science* that Prof. S. J. Barnett has resigned his post as professor of physics at the Ohio State University in order to accept the position of physicist in charge of experimental work at the department of terrestrial magnetism of the Carnegie Institution of Washington. Prof. Barnett entered upon his new work at Washington on July 15.

THE Council of the Institution of Electrical Engineers has been in communication with the Ministry of National Service with reference to the utilisation, with due regard to their skill, of members of the institution called up for military service under the Military Service Act, 1918, No. 2. With the view of their being posted, so far as vacancies are available, to technical units, members of the new military age, on being called up for military service, are therefore invited to communicate with the secretary of the institution, who will supply them with the form and certificate approved by the Ministry for this purpose.

THE twenty-ninth annual general meeting of the Institution of Mining Engineers will be held at University College, Nottingham, on Friday, September 13, under the presidency of Mr. Wallace Thorneycroft. The Institution medal for the year 1917–18 will be presented to Mr. C. E. Rhodes. The following papers will be submitted: A Method of Determining the Magnetic Meridian as a Basis for Mining Surveys, T. Lindsay Galloway; The Chance Acetylene Safety-Lamp, W. Maurice; Recent Developments in the Coalfields South of Sydney, New South Wales, Dr. J. R. M. Robertson.

NO. 10 of the *Berichte der deutschen chemischen Gesellschaft*, which has been published after some delay, contains the announcement of the death of Dr. Johannes Thiele, professor of chemistry in the University of Strasburg, at the age of fifty-three. Prof. Thiele first became well known by his work on nitro- and amino-guanidines, which opened up new methods of preparing hydrazine and hydrazoic acid, and secured for him an appointment as extraordinary professor at Munich. Here, as a result of Baeyer's work on the reduction of muconic acid, he took up the study of what were afterwards called conjugated double-bonds, and developed his theory of partial valencies, by which he was best known. Prof. Thiele was appointed successor to Fittig at Strasburg in 1902.

THE German Chemical Society has celebrated its jubilee by collecting a fund of 2½ million marks for the more extensive publication of chemical works of reference, such as Beilstein. We notice further, in a report of the annual general meeting, that an agreement has been concluded with the Verein deutscher Chemiker with regard to publications. The *Chemisches Zentralblatt* will deal more fully with technical chemistry, and will be available to the members of the latter society at a reduced rate. The *Berichte* will be subdivided, one section dealing with reports of meetings, notices, etc., the other containing the original scientific publications. The annual subscription to the German Chemical Society will become 10 marks, but will then only entitle members to receive the first of the above-named sections. A separate subscription will be required for the scientific section, as was already the case with the *Zentralblatt*.

DR. A. C. HADDON discusses in the August issue of *Man*, with numerous sketches, an anomalous form of outrigger-canoe attachment in use in the Torres Straits, and its distribution. The normal arrangement of connecting the float to the outrigger booms is in the Y form. This occasionally becomes modified into the V or U form. Some doubt still exists as to the origin and distribution of these modifications. But Dr. Haddon states that his "main object in compiling these notes is to emphasise how suggestive such an apparently insignificant feature as an outrigger attachment may be in the elucidation of the problems of distribution."

MR. T. SHEPPARD has reprinted from the *Naturalist* for July an account of a small but interesting exhibit of Bronze-age weapons from the collection of the late Cotterill Clark, now deposited in the Doncaster Museum. The specimens include a rapier-shaped blade, six spears, one flat axe, eight palstaves, three socketed axes, and a chisel, all from the eastern side of Doncaster, where, owing to the prevalence of fen bogs, such objects would be likely to be lost. One of the palstaves is of a somewhat unusual pattern, those with a transverse edge; as Sir J. Evans remarked: "Palstaves of the adze form, having the blade at right angles to the septum between the flanges, are seldom found in Great Britain." He figures examples from Cumberland and Lincolnshire, and mentions other specimens. The Doncaster example is different from any described by Sir J. Evans, but approaches nearest to that from Lincolnshire.

IN the *Museums Journal* (vol. xviii., No. 2, August, 1918) Mr. Harlan I. Smith, archæologist, Geological Survey, Canada, in a paper entitled "Archæological Museum Work and the War," remarks that the war has cut off from many firms in Canada and the United States the supplies of new designs in many industries, such as the textile trades, which were supplied by foreigners. To meet the sudden stoppage of the design supply, the writer has prepared an album of archæological specimens found in Canada suitable as motives for distinctive Canadian decorative and symbolic designs and trade-marks. In the same way in America designers have been developing designs from aboriginal objects in the United States museums, specimens from Peru, Mexico, the South-Western States, Siberia, China, etc. Though the colour combinations in silks woven from some of the designs developed from New World specimens are poorer than aboriginal colour combinations, yet these silks met with a ready sale, thus proving that aboriginal designs are not, as some have believed, crude, but can be successfully used in modern industries.

THE July issue of *Science Progress* contains an interesting article by Sir Henry Thompson on the food requirements of a normal working-class family. A comparison is instituted between the physiological values of the diets reported upon by the Board of Trade in pre-war times and some data collected by the War Emergency Committee in 1917. In reducing the family diets to man-values Sir Henry Thompson has employed a more liberal scale of requirements for children than the older standard of Atwater, which is now generally recognised to be unsatisfactory. The three diets do not differ greatly in respect of energy-value; the highest average is that of the urban working-class families (1913), yielding 3410 calories; the lowest, the 1917 sample, is 3160 calories, a reduction of but 250 calories. Sir Henry also provides ration scales based upon his estimate of the food consumption of Great Britain in 1908, upon that of the Royal Society's Food Committee for 1909–13, and upon the committee's estimate for the war-year 1916. Making allowance for loss in distribution, the calorie values of the diet scales calculated in this way do not differ very much from the observed values in the samples, although, as might be expected, the proportion of energy derived from breadstuffs is rather larger among the working-class families which provided the sample budgets than in the country as a whole.

A BRIEF, but very admirable, summary of the factors causing "grouse disease" on Scottish moors appears in *British Birds* for August. The author, Mr. Dugald Macintyre, surveying the conditions of heather-moors and their relation to "heather-blight," is of opinion that when, in exceptional years, heather suffers from frost in June, drought in July, and an excess of wet weather and too little sunshine during the early spring months—a combination of adverse conditions aggravated by the ravages of the heather-beetle—grouse disease is inevitable, and for the reason that the birds succumb to the drain on their vitality caused by their internal parasites, which in normal years of plenty cause them little or no discomfort. A practical remedy for grouse disease, he suggests, would be artificial feeding in those years when the heather crop fails. This he tried with a fair measure of success in 1912. The food supplied to the birds, after they had been trained to visit oat-sheaves laid out on the moors, was small, round maize, which the birds ate greedily. The ravages of the disease, he considers, are to be attributed largely to the fact that the birds are now artificially numerous; that is to say, the moors are carrying more birds than would be the case if they were left to "run wild."

So little is known generally of the vast and varied flora of South Africa that the short sketch of "The Plant Geography of South Africa," written by Mr. I. B. Pole Evans, chief of the division of botany and plant pathology in the Department of Agriculture, is very welcome. The sketch was printed in the official "Year Book" for last year, and has now been reprinted as a separate pamphlet. The vegetation is considered under the three main heads of woodland, grassland, and desert. All three types are well represented in the Union of South Africa, which includes almost all the area lying south of latitude 22° from the valley of the great Limpopo River and the Tropic of Capricorn to the sea. The article is accompanied by a good vegetation chart marking the forest and scrub area in the south and south-west, the palm belt along the Natal and Mozambique coast, with the thorn-veld extending from the south coast from Port Elizabeth to East London, and then to the west of the palm belt as far as the Transvaal. Basutoland and the Orange Free State Colony are almost entirely high veld, while the Transvaal is marked as bush veld, and the centre of the area is the Kalahari grassland. The Karroo and Namaqualand are, as is well known, extensive desert areas. Brief descriptions of the more prominent types of vegetation are given, and lists of the typical trees, grasses, and other plants, with particulars as to where such plants may be found. Not the least valuable portion of the article are the twenty-four excellent plates showing features like the natural Drakensberg forest, the silver trees on Lion's Head at the Cape, the acacia thorn veld, the Euphorbias of the bush veld in the Transvaal, and some very interesting photographs of the high veld grassland near Johannesburg and Pretoria. All the photographs have been taken by Mr. Pole Evans, and are very well reproduced. It is much to be hoped that a systematic botanical survey of the whole region may shortly be undertaken before any further changes in the vegetation due to the disturbing influence of man take place.

MUCH light is thrown on Balkan problems by a map compiled by Prof. Jovan Cvijic of the zones of civilisation in the Balkan peninsula. The map, which appears in the *Geographical Review* for June (vol. v., No. 6), is accompanied by a short article, and follows a map and paper by the same author in the previous number of the review on the distribution of Balkan races. Studied side by side, these maps are most instructive. In the present map Prof. Cvijic distinguishes three main civilisations: the old Balkan or modified Byzantine, distributed in Thrace, Macedonia, and Greece in the main; the Turko-Oriental, principally in the south-east, in the Vardar valley, and in parts of Bosnia; and, lastly, the patriarchal *régime* in the north and west of the peninsula. Attempts are also made to map the various contacts between these civilisations and those of Central and Western Europe. Western civilisations reached the Balkan peninsula chiefly by sea routes, and, according to Prof. Cvijic, nowhere, except along certain easy routes, penetrated far inland. From Trieste to Constantinople the seaboard shows Mediterranean influences. There are traces of Venetian civilisation in Serbia, but too few to be mapped. Magyar civilisation was a later influence, but it has spread widely and deeply along the main routes. Naturally, it is felt most in cities. Finally, Prof. Cvijic notes the tendency, especially in Serbia, to create a new endemic civilisation out of the mingling and fusion of other civilisations. The depth and power of spreading of that national civilisation will be a determining influence in the Balkans in future years.

A paper by the late Mr. R. C. Burton on "The Laterite of Leoni, Central Provinces" (Records Geol. Surv. India, vol. xlviii., p. 204, 1917), revives the frequently expressed view that some pisolitic laterites, at any rate, have accumulated by deposition as lacustrine strata. Grey bauxite is interbedded with laterite at Aturwani, and must have had a similar origin. Near Magarkatta, bright red lithomarge, passing into a brecciated condition, contains veins of kaolinite. Mr. Burton, who died from wounds received in the present war, was probably unable to examine the most recent literature on the interbasaltic rocks of Ireland, where similar associations have been recorded, and where pisolitic structure occurs within the bole that results from the decay of basaltic lavas by penetrating influences from above. He refers, however, to the views of Forbes and Mallet, who accepted a lacustrine origin, and to those of Lacroix (1913) as to the formation of concretionary pisolite *in situ*. Where, as the author believed to be the case in Leoni, the limits of the laterite coincide with those of a former lake, the pisolitic structure may well be a feature of original deposition.

Korea is maintaining its claim to systematic registration of climatic conditions, as shown in the issue of the annual meteorological report for the year 1916, compiled under the direction of the Government-General of Chosen (Korea). Hourly observations made at Jinsen (Che-mul-po) are given for each month for air pressure, air temperature, relative humidity, direction and speed of wind, hours with sunshine by Jordan's recorder, and remarks showing the character of general and exceptional weather. Monthly and annual results at twelve stations well scattered over the peninsula from four-hourly observations are given for the elements already mentioned, as well as for tension of water vapour, precipitation, evaporation, direction of upper clouds, and surface temperature of earth. There are results of observations of air temperature and precipitation at 182 auxiliary meteorological stations, many of which are lighthouses, where observations are made three times daily. The volume also contains results of seismic observations at Jinsen. A map is given at the end of the report showing the geographical distribution of meteorological, climatological, and rain gauge stations in Korea at the end of 1916. The whole of the peninsula is well covered by observations. In summarising the work done, mention is made of improvements in the routine work as the result of the decision of the congress of the directors of all the meteorological stations of the Japanese Empire held in Tokyo. The present volume shows an increase from nine to twelve in the number of branch meteorological stations. It is noteworthy that special attention is given to the selection of a suitable site in the matter of an observatory. Change has been made in the position of the building at Taikô. Improvements have been made in the issue of weather forecasts and storm warnings. Experience shows that a gale caused by a cyclone passing through the peninsula ceases generally within about twenty-four hours, so it has been determined that the effective interval of a warning is twenty-four hours from the time of issue.

An interesting gravitational problem, with a bearing on the theory of coral reefs, has lately been studied by Motonori Matsuyama (Memoirs of the College of Science, Kyoto Imperial University, vol. iii., No. 2, February, 1918). Using an Eötvös gravity-variometer, he has determined the second derivatives of the gravitational potential (the complete set of these derivatives defines the space variations of the first derivative, *i.e.* of the gravitational acceleration or force, which was not measured and remains still unknown) in the Jaluit Atoll. This atoll (169° E., 6° N.) is situated at the southern end of the Ralick chain of the Marshall Islands. The shallow lagoon, of irregular rhombic shape (the diagonals being about 30 km. and 50 km. in length), is surrounded by a narrow coral reef about half a kilometre wide, with its top just at the level of low water. On this reef low banks of coral, sand, and *débris*, rising just above high water, form a chain of discontinuous islets. The island is situated in a sea which at ten kilometres distance from the atoll is four kilometres deep. The study of the gravitational field on an isolated island of very simple construction is calculated to throw light on the state of mass distribution under the atoll. The coral reef is built on a denser foundation, probably of volcanic origin, and the differences of density between the water, the reef, and the foundation are, to some extent known. The problem which the gravitational data help to solve is that of the distribution and depth of the coral. After various instrumental and other corrections (for the effect of tides, the oblateness of the geoid, etc.) had been applied to the observed second derivatives of the potential, these were compared with the second derivatives theoretically calculated, on various assumptions as to the depth of the coral reef and the density of the foundation. For convenience in the numerical integrations employed, the foundation was supposed flat; three values were assumed for its density, viz. 2·6, 2·8, and 3·0. The "effective" depths determined for the coral reef ranged from 243 to 1000 metres.

E. Elöd (*Elektrotechnische Zeitschrift*, March 21) has carried out experiments from which he concludes that during the formation of nitric oxide by the electric arc in the production of nitric acid from the air, the electric discharge causes the nitrogen and oxygen to split up into atoms, so as to be capable of producing chemical reactions.

The use of black millet (*Sorghum vulgare*) for the production of alcohol has been suggested in Germany (*Zeitschrift für angewandte Chemie*, April 23), for which purpose it possesses suitable properties. The food-value of the grain is high, so that its cultivation, which costs no more than wheat or rye, is recommended to the farmer as being a paying crop. The use of the "straw" as a source of cellulose or alcohol would make the crop doubly valuable. According to recent French notices, the cultivation of sorghum for the production of sugar has been widely suggested.

According to the *Zeitschrift für angewandte Chemie* for May 17, at a recent meeting of the German Bunsen Society the question of the production of synthetic rubber was discussed, and its possibilities as a substitute for the natural product considered. In spite of the difficulty of obtaining material, 150 metric tons of synthetic methyl rubber are produced monthly. At first the substitute proved unsatisfactory, being oxidised by the air, and it was hard to vulcanise. Improvements in manufacture have, however, overcome this trouble. By experimenting with the addition of other substitutes, a vulcanite is now produced which equals the natural material in firmness and durability, and is 20 per cent. better for electrical purposes. At ordinary temperatures, however, the soft rubber is not elastic, but leather-like; it becomes elastic as its temperature is raised. The addition of dimethylaniline and toluidine increases elasticity. The substitute is now used, with satisfactory results, for heavy road motors.

THE Reichsanstalt at Charlottenburg has carried out an extensive series of tests on the effect of chemical changes and heat treatment on the magnetic properties of iron alloys. Tests were also made to ascertain the change of the temperature coefficient of bar-magnets with variations in their dimensions. Reducing the length of a 0·6 cm. thick bar from 22 to 2·4 cm. produced an increase of 2·4 to 4·2 per cent. in the mean temperature coefficient between 20° and 100° C. Tests were made with bars 0·9 cm. thick and of length varying between 33 cm. and 6 cm.; and it was found that the determination of the coercive force was trustworthy within 1 to 2 per cent. (using the magnetometer method) for cylindrical bars with values of l/d (l=length, d=diameter) down to 10, but that the value obtained for the coercive force was rather too small for lower values of l/d. These results are given in the *Zeitschrift für Instrumentenkunde* for May last, but the main results of the investigation will not be published until after the war.

SULPHUROUS acid liberated in the combustion of pyrites and other sulphurous substances contained in coal is rapidly transformed into sulphuric acid in the atmosphere. It is found in rain-water and snow. If the rain-water or snow is left for a few hours, the small quantities of non-oxidised sulphurous acid that they contain are rapidly converted into sulphuric acid. Thus the determination of the quantity of sulphuric acid in the snow or rain provides a means of determining the vitiation of the air in a particular industrial district by factory smoke. In one and the same industrial region from 6 to 9 mg. of sulphuric acid (or sulphuric anhydride) per cubic metre of snow was found in places protected from the wind, and three times that quantity in places not so protected. The mean was 15 to 20 mg. The quantity diminishes rapidly with increase in distance from the source of vitiation. According to the *Zeitschrift für angewandte Chemie* for April 9, similar data were found on experimenting with rain-water. It is also possible to determine the deleterious action on plant-life through the same cause by collecting, by suitable means, the rain collecting at a tree-trunk, and comparing the foliage, etc., with that of other trees in another neighbourhood (not near a factory) offering the same climatic conditions.

THE June *Biochemical Journal* contains work on the antineuritic and antiscorbutic accessory substances by Messrs. A. Harden and S. S. Zilva. These authors find that pigeons are protected from attacks of polyneuritis by autolysed yeast, but not by autolysed yeast which has been shaken with fuller's earth or with dialysed iron, thus confirming Seidell's observation. Further, polyneuritis is curable by autolysed yeast, but not by autolysed yeast which has been treated with the adsorbent, and a bad case was cured by administration of the solution obtained by alcoholic extraction of the dialysed iron precipitate and evaporation *in vacuo*. On the other hand, when the precipitate obtained by shaking orange-juice with dialysed iron is extracted with alcohol, the product will not cure guinea-pigs of scurvy, nor will it protect healthy animals against attacks of the disease. But orange-juice which has been treated with dialysed iron or with fuller's earth retains practically all its antiscorbutic activity so far as can be judged biologically. A mixture of equal parts of orange-juice and autolysed yeast will both cure and protect from attacks of polyneuritis and scurvy. But after treatment with fuller's earth the mixture was found to have lost its antineuritic power whilst retaining its activity against scurvy. Thus it is shown that the antineuritic and antiscorbutic principles behave differently towards adsorbents. Orange-juice can be filtered through a Berkefeld filter without losing an appreciable amount of its antiscorbutic activity.

IN order to supply material for testing the theories of thermal and electrical conductivities in metals and alloys, and especially in ferro-magnetic substances, Prof. K. Honda, of Sendai University, has measured the thermal and electrical conductivities of a number of nickel-steels. His results are given in the July issue of the Science Reports of the University. He finds that both the electrical and thermal conductivities decrease rapidly as iron is added to nickel or nickel to iron, and that an alloy containing 30 per cent. of nickel has the least conductivity in both cases. The curves showing the variation of the conductivities with content have the same general appearance as the melting-point curves for a binary mixture. The least electrical conductivity is about one-fifth and the least thermal about one-tenth the conductivity of either pure substance. The quotient of the thermal by the electrical conductivity varies from about 2 to about 1·5 millions. The magnetisation curves for the alloys are also given, and show low susceptibilities for alloys containing 27 to 30 per cent. of nickel.

RAPID inter-Imperial communication of every description now promises to become so vital a matter for developing inter-Imperial trade—as well as for other eminently important national reasons—that Mr. Charles Bright has prepared a revised edition of the map included in his recent book, "Telegraphy, Aeronautics, and War," showing not only the world's cable system, but also (1) both past and prospective "wireless" stations, (2) suggested air stations. The map will be issued shortly by the publishers of the volume, Messrs. Constable and Co.

THE *University of London Press, Ltd.*, is about to issue "Everyman's Chemistry: The Chemist's Point of View, and his Recent Work told for the Layman," by E. Hendrick. The *Yale University Press* (and, in London, *Mr. Humphrey Milford*) will publish shortly "Human Nature and its Re-making," by Prof. W. E. Hocking.

OUR ASTRONOMICAL COLUMN.

VARIABLE STARS.—As many of the ephemerides of these stars that were formerly available are discontinued or inaccessible owing to the war, M. Luizet has prepared a useful set of ephemerides for 1917, which is published in the *Journal des Observateurs* (vol. ii., No. 8). It comprises 124 stars of the Algol type, 18 stars of the β Lyræ type, and 33 stars of the δ Cephei type; the period and date of first minimum (or maximum) in each month of 1917 are given, and other data, which make it easy to calculate